REMARKS

Claims 1-4 are all the claims pending in the application.

Please cancel the Appendix attached to an Information Disclosure Statement which was submitted on March 6, 2002.

Reconsideration and removal of the rejection of claims 1-4 under 35 U.S.C. § 103(a) as obvious based on a combination of Asakawa (U.S. Patent No. 5,117,109) in view of Onishi (U.S. Patent No. 5,449,902) are respectfully requested on the basis of the present amendment to the claims and the following remarks.

The Examiner acknowledges that Asakawa does not disclose a plurality of trapping columns, but contends that Onishi shows such a feature. It is also alleged that it would have been obvious to one of ordinary skill in the art to apply a plurality of trapping columns as taught by Onishi to the liquid chromatography mass spectrometer of Akasaka to allow for analyzing multiple successive components of interest and allow for a changeover in functions.

Applicants' invention is directed to a multi-dimensional separation technique having two (or more) different, orthogonal separation modes. Specifically, the present invention adopts a profiling method, which enables the chromatograph separation system to comprehensively separate and detect components in the sample. The profiling method includes a peak elution pattern analysis. In other words, the present invention is intended to provide a multi-dimensional separation based on a profiling method which enables the system to simultaneously

separate and detect as many multi-components as possible in one sample at one analysis running, rather than an analysis only for several specific targeted analytes.

While the Asakawa system has plural sample tubes and a single trapping column and is utilized for sample pre-treatment, such as dilution, it is aimed at collecting a limited number of targeted components in a sample solution. Thus, the Asakawa system is not intended for use in multi-dimensional separation since Asakawa does not adopt the profiling method which allows analyzing as many components as possible in a sample simultaneously.

The further reference to Onishi shows an apparatus having a valve mechanism on which plural trapping columns can be mounted, several flow pathway configurations and a control mechanism. However, the Onishi system has just one analytical column. Thus, Onishi does not suggest or teach multi-dimensional separation.

In sum, the systems as taught by Asakawa and Onishi are aimed solely at online pre-treatment methods when (just before) elutants separated by liquid chromatography are loaded for mass spectrometry. Neither of the systems is intended for use in a multi-dimensional separation based on a profiling method using two (or more) different, orthogonal separation modes. Applicants' claim 1 has been clarified to highlight this feature.

Further, the references disclosed in the present specification teach switching valves utilized for achieving multi-dimensional chromatographic separations, as defined in the present invention. No suggestion is made in those references of a system having the mechanism of changing a plurality of trapping columns successively, without intermitting the flow on the 1st system, while eluting sample components from the 1st analytical column. By the same token,

while both Asakawa and Onishi disclose an online pre-treatment, such as desalting, neither of the patents discloses a feature of trapping elutants from the 1st analytical column by switching plural trapping columns successively, independently of the separation operation in the column, without intermitting the flow of mobile phase.

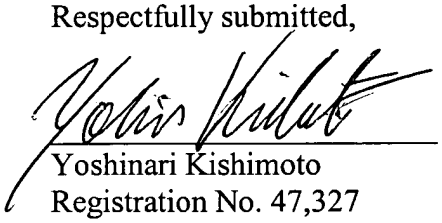
Furthermore, there would have been no motivation to have combined the Asakawa teachings with the Onishi teachings, since combining or modifying these references would render either reference inoperable, or unsatisfactory, for its intended principle of operation. The references, therefore, would not have provided any suggestion or motivation. MPEP §2143.01, citing In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984), and In re Ratti, 123 USPQ 349 (CCPA 1959). Specifically, the two references are not combinable because the six-port valve V_4 utilized for changing lines , as taught in Asakawa, is not combinable with a change-over valve for allowing a plurality of trapping columns to be respectively washed, trapped, desalted and eluted in parallel, as taught in Onishi.

Even if one were to combine the applied references, the combination of those references would not teach or suggest all the claim limitations, as mentioned above.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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